

Baiocchi 2-8-2-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): F.A. Baiocchi et al.
Case: 2-8-2-3
Serial No.: 10/697,757
Filing Date: October 30, 2003
Group: 2818
Examiner: Thinh T. Nguyen

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature:

Date: February 22, 2005

Title: Enhanced Substrate Contact for a
Semiconductor Device

TRANSMITTAL LETTER

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is the following document relating to the above-identified patent application:

(1) Response to Restriction Requirement.

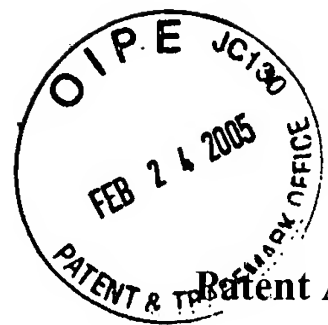
There is no additional fee due in conjunction with the response. In the event of any non-payment or improper payment of a required fee, the Commissioner is hereby authorized to charge or to credit **Ryan, Mason & Lewis, LLP Deposit Account No. 50-0762** as required to correct the error.

Respectfully submitted,

Date: February 22, 2005

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Signature:

David Tulpis

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Semiconductor Device

RESPONSE TO RESTRICTION REQUIREMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In an Office Action dated January 21, 2005, the Examiner required restriction of claims 1-22 to one of the following two groups of claims: (i) claims 18-22 (Group I); and (ii) claims 1-17 (Group II). Specifically, the Examiner contends that the inventions set forth in Groups I and II are distinct in that "the process as claimed can be used to make other and materially different product" and that "the [product] as claimed can be made by another and materially different process" (Office Action; page 2, last paragraph). Applicants respectfully disagree with this contention and respectfully request reconsideration and withdrawal of the requirement for restriction for at least the reasons given below.

Applicants submit that the apparatus set forth in claim 18 cannot be made by a process other than and materially different from the method set forth in claim 1, and that the method of claim 1 cannot be used to form a product other than and materially different from the product set forth in claim 18. Accordingly, Applicants assert that claims 1 and 18 should be examined together. The Examiner provides an example in an attempt to show distinctness of the two indicated groups of

claims, stating that “the step of substantially filling the at least one trench with a filler material can be performed first and the step of doping at least one or more sidewalls of the at least one trench with an impurity of a know concentration level so as to form a low-resistance electrical path between an upper surface of the epitaxial layer and the substrate can be performed second which is materially different from claim 1” and the same semiconductor structure set forth in claim 18 will result (Office Action; page 2, last paragraph). While it may be true that claim 1 is not limited to the exact order in which the process steps are performed, the semiconductor structure recited in claim 18 also comprises a trench which is formed using the same steps as recited in claim 1.

Specifically, the table below illustrates the correspondence between the elements of independent claims 1 and 18.

CLAIM 1	CLAIM 18
A method of forming a semiconductor structure in a semiconductor wafer, the method comprising the steps of:	A semiconductor structure, comprising:
forming an epitaxial layer on a least a portion of a semiconductor substrate of a first conductivity type;	a substrate of a first conductivity type; an epitaxial layer formed on at least a portion of the substrate; and
forming at least one trench through the epitaxial layer to at least partially expose the substrate; doping at least one or more sidewalls of the at least one trench with an impurity of a known concentration level . . .; and substantially filling the at least one trench with a filler material.	at least one trench formed through epitaxial layer and at least partially exposing the substrate . . . the at least one trench being formed comprising the steps of: (i) forming at least one opening through the epitaxial layer to expose at least a portion of the substrate, the at least one opening corresponding to the at least one trench; (ii) doping at least one or more sidewalls of the at least one opening with an impurity of a known concentration level; and (iii) substantially filling the at least one opening with a filler material.

Application Serial No. 10/675,633

As apparent from the above table, each of the steps recited in the method of claim 1 has a corresponding element in the apparatus set forth in claim 18. Applicants submit that the apparatus set forth in claim 18 cannot be made by a process other than and materially different from the process set forth in claim 1, and that the process of claim 1 cannot be used to form a product other than and materially different from the product set forth in claim 18.

The apparatus set forth in independent claim 18 and the method set forth in independent claim 1 are of such similar character as to essentially eliminate the necessity for a separate search and/or classification. Accordingly, the inventions set forth in the subject claims are properly linked to one another and should be considered together. Applicants assert that, in the interest of conservation of resources for the Patent Office as well as the Applicants, the claims of Group I and Group II should be considered together. Withdrawal of the restriction requirement in the present application is therefore respectfully solicited.

Notwithstanding the above traversal, Applicants hereby provisionally elect the claims of Group II, namely, claims 1-17, for prosecution on the merits.

It is believed that there is no fee due in conjunction with the present response. In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Ryan, Mason & Lewis, LLP Deposit Account No. 50-0762** as required to correct the error.

Respectfully submitted,



Date: February 22, 2005

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